

REMARKS

Claims 1 and 3-11 have been rejected under 35 U.S.C.103 over Ohman in view of Lovin. This rejection is respectfully traversed.

The method of the present invention, in its broadest aspect, concerns producing a printed packaging material by applying an actinic radiation activatable liquid ink to the material, exposing the ink to a first actinic radiation, applying an energy-curable coating over the ink and curing the coating with a second actinic radiation. As pointed out at the bottom of page 3 of the application, the term "actinic-radiation activatable ink" means that the ink is substantially free of curable functionality, i.e., functional groups that can be cross-linked or polymerized.

Ohman teaches the production of a packaging laminate in which a printing ink is applied to the surface of the laminate, overcoated with a radiation curable lacquer and then cured with UV light or electron radiation. The suggestion at page 2 of the Office Action at the 4 lines starting at the first asterisk to the effect that [0031] discloses exposing the ink to UV light prior to the application of the radiation-curable lacquer is not correct. Paragraph [0031] does refer to radiation curing but only to say that a radiation curable printing ink is an ink which can be cured by radiation with UV light – it does not say or suggest curing the ink prior to application of the lacquer. The only sequence involving application of UV light disclosed in this reference is where the radiation curable ink and radiation curable lacquer are simultaneously cured using a common UV radiation source. This is shown in paragraph [0034]. Thus, the Examiner is correct in stating on page 2 that "Ohman et al fail to specifically disclose the separate exposure of the ink prior to being over coated with a transparent layer."

The Office Action asserts that the claims do not recite that the ink is cured prior to being overcoated with a transparent layer. It is respectfully submitted this assertion is not correct because that sequence is the only sequence which is consistent with the claim structure, and that any other interpretation would be rejected by the skilled person to whom the claims are directed. If the substrate were coated with ink and overcoated with a transparent layer, why would two separate curing steps be needed? The first curing step would cure both layers making the second curing step a needless and unnecessary act. Applicants would have no objection to stating that the recited steps are done in sequence, since that is already inherent in claim 1, but have not done so in this response only because of the “final” status of the Office Action.

Lovin teaches a process in which a radiation curable ink is applied to a substrate, partially cured by UV radiation, overcoated with another layer of radiation curable ink and then radiated with EB to cure the first and second ink coatings. Both of Lovin radiation curable inks contain curable functionality. As the Examiner previously noted, Lovin fails to teach or suggest the application of an energy curable coating to the first ink after UV irradiation.

The Final Rejection states (here and elsewhere) that “[t]he instant application does not recite, ‘the ink is substantially free of curable functionality’ as argued by the applicant.” That statement overlooks the fact that the recitation is found on the last 3 lines of page 3 of the specification. As a result of overlooking the statement, the Final Rejection indicates it is giving the term “actinic radiation activatable liquid ink” a broader construction, apparently based on the standard that terms are given their broadest reasonable interpretation. However, the standard is not just that the broadest reasonable interpretation is used but that terms are given their broadest reasonable interpretation

consistent with the specification. See, e.g., MPEP § 2111. Here, any interpretation that the term can be construed such that the ink need not be substantially free of curable functionality is directly inconsistent with page 3 of the specification and is not permissible.

The sole reason for partial curing in Lovin is to avoid pick-off and smearing of the first ink (containing curable functionality) resulting from the fact that the first ink has been deliberately only partially cured (col. 5, lines 26-28) when the second ink (also containing curable functionality) is applied. The Final Rejection expresses disagreement, and avers that "pick-off and smearing is well-known problem in the packaging material field." No factual basis for this assertion of a well-known problem has been advanced, whether by literature citation or Examiner affidavit in accordance with MPEP § 2144.03(C). Accordingly, the burden on the PTO to establish the existence of such a problem has not been satisfied. Even if it had, there is no indication anywhere in Ohman that pick-off and smearing is a problem in that system, and quite to the contrary, Ohman states in [0034] that a particular feature of that system is that only a single UV curing is used, making the process efficient and extremely rapid. There is no reason to look to Lovin for a way to solve a problem which Ohman does not face. An intermediate cure procedure is contrary to Ohman, and would result in a loss of the efficiency and speed characterizing the Ohman process.

The Final Rejection advances two other reasons to rely on Lovin. First, it is asserted that the reference teaches the final cure would lead to a product which withstands environmental treatment and prevents shrinkage. But this assertion about a final cure does not provide a reason for an intermediate curing of ink prior to overcoating in order to solve a problem which is non-existent in Ohman while sacrificing efficiency and speed. Second, it is asserted to be obvious to UV cure in order "to lower the amount of

photoinitiator that migrate to food in packages”, but this is not a rationale to conduct an intermediate cure as the same result is achieved using a single final cure procedure without the additional time, expense and bother of an unnecessary procedure. In any event, Lovin’s radiation curable inks still contain curable functionality even if the photoinitiator amount may be lower.

In light of the foregoing considerations, it is respectfully submitted that a skilled person would not combine these two references.

Claims 1, 4, 5, 7, 8 and 11 were rejected under 35 U.S.C.103 over Lovin in view of Edlein.

Lovin has been discussed above. It fails to teach or suggest the application of an energy curable coating to the ink after the partial UV irradiation, and uses a pair of radiation curable inks which contain curable functionality. It conducts a partial curing of the ink.

Edlein teaches a process in which one or more solvent based inks are applied to a thermoplastic packaging material, affixed to the material by the application of air and/or heat, overcoated with a pigment free coating containing a polymerizable material and then exposed into ionizing radiation. The rejection is based on the assertion that it would be obvious to incorporate the use of a radiation curing overcoat in the method of Lovin to protect the image made by the first ink, but the result of doing so would not be the claimed method. The resulting process would still involve the initial application of a radiation curable ink which contains curable functionality. Further, there is no reason to employ the

overcoat in this manner since Lovin states that the procedure disclosed therein already protects the image.

Beyond the foregoing, it should also be noted that Edlein specifically distinguishes his method from that of Lovin in column 9, pointing out that the partial curing UV step is unnecessary. This is another reason that the combination of Lovin and Edlein is inappropriate and does not teach or suggest the invention claimed in this case. The Final Rejection expresses disagreement with this because, it is asserted, that Edlein incorporates Lovin by reference. In response, it is respectfully pointed out that the very sentence containing the incorporation states it is doing do for Lovin's disclosure of a central impression cylinder flexographic arrangement, and the next two sentences explicitly distinguish the Edlein and Lovin type of inks. The fact that both references can employ a CI flexographic cylinder to apply an ink or coating does not suggest the claimed procedure.

Claims 1, 2, 5, 6, 9 and 11 were rejected under 35 U.S.C. 103 over Mossbrook in view of Lovin. This rejection is also respectfully traversed.

Mossbrook discloses a method in which a printed image is applied to a thermoplastic film having a thickness of less than 15 mils using a radiation curable or solvent based ink followed by applying an overprint varnish and curing the overprint varnish with radiation energy. Mossbrook fails to disclose exposure the ink to UV after being applied to the film and before the overcoating. There is no teaching or suggestion in Mossbrook that the ink image is subject to pick-off and smearing, or that there is any problems with either shrinkage or the food packaging environment. This is significant because Mossbrook was clearly aware of such image damage problems after curing the

overprint (see [0045]), and is making a product for use in food packaging. As noted above, the assertion that “pick-off and smearing is well-known problem in the packaging material field” lacks a factual basis either by literature citation or Examiner affidavit in accordance with MPEP § 2144.03(C), and therefore, the burden on the PTO to establish the existence of such a problem has not been satisfied. Even if it had, there is no indication anywhere in Mossbrook that pick-off and smearing is a problem in that system

Lovin is relied on to show partially curing to avoid pick-off and smearing, or problems with shrinkage or the food packaging environment. But there is no reason to incorporate Lovin’s intermediate partial curing into Mossbrook. There is no reason to address problems which did not exist in the first instance, or to deliberately introduce that problem into the Mossbrook procedure. Moreover, even if that partial cure procedure was, for no good reason, introduced into the Mossbrook method, the result would not be the claimed invention since it would involve applying an ink containing curable functionality onto the substrate whereas the invention uses an actinic radiation activatable ink which is substantially free of such functionality. That is clearly unobvious since there is no apparent reason to subject an ink free of curable functionality into an energy curing system such as UV or EB. Applicants above response to the curable functionality comment is equally applicable to its repetition on page 12 of the Final Rejection.

Claims 1, 11, 15, 16 and 17 were rejected under 35 U.S.C.103 over Mossbrook in view of Lovin and Chatterjee. This rejection is respectfully traversed.

The combination of Mossbrook and Lovin has been discussed above and shown not to render the independent claims involved in this rejection. Chatterjee is relied upon solely to show that it is possible “to perform a solvent rub test” (Final Rejection page 7).

The fact that such a possibility exists does not make it obvious that the packaging material has a specific solvent rub test result. Moreover, this additional reference does not cure any of the deficiencies in the combination of Mossbrook and Lovin and, therefore, these claims recite patentable subject matter. Further, only claims 15-17 refer to a rub test and therefore, the applicability of this rejection to claims 1 and 11, which do not recite a rub test result, is not apparent.

The Final Rejection states it disagrees with the foregoing and it would be obvious to incorporate Chatterjee's rub test into Mossbrook. In response, applicants respectfully point out that incorporating Chatterjee's rub test into Mossbrook may address the additional recitation of dependent claims 15-17, but it does not address the deficiencies in the base combination of Mossbrook and Lovin, discussed earlier. The Final Rejection quite correctly does not contend Chatterjee cures those deficiencies, and they remain even after incorporating the rub test.

In view of all of the above consideration, applicant believes the pending application is in condition for allowance.

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Respectfully submitted,

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